

Science for Environment Policy

New tool to aid evidence-based decisions on how to eradicate alien species

A new tool to help environmental managers make faster, more evidence-based decisions on how to eradicate alien aquatic species has been developed. The tool is a statistical model based on over 140 management case studies in the scientific literature. Packaged as a user-friendly computer program, it allows different management options to be easily compared.

Ideally, environmental management decisions, such as how to tackle alien species, would be made based on all of the available information regarding that issue; they would be evidence-based decisions. However, in reality there are a number of hurdles that environmental managers face in achieving this, such as the time needed to find and review the scientific literature before action can be taken.

Even when scientific information is readily summarised, such as in 'systematic reviews', often these do not fully compare different techniques or allow managers to predict how they would perform in a new situation. This means that managers often have to rely on more limited personal experience or expert advice to inform their decisions.

A new tool has now been developed which could help environmental managers to examine the chance of success of different management strategies for the eradication of alien aquatic species rapidly.

The researchers carried out an extensive search of studies on managing alien aquatic species, selecting 143 case studies from 79 articles or reports in the scientific literature. From these, they created a statistical model which estimates the likelihood of success of a given measure in eradicating the alien species in different situations.

The statistical model was packaged into a computer program with a simple interface and results pages which could be used to calculate and compare the likelihood of success of different interventions and identify what kind of information should be collected to improve the reliability of the estimates.

The approach has a number of advantages. For example, it allows managers to include information from their own case studies, if they have them, tailoring results for their specific situation. The accuracy of the model also improves as more data is added. Importantly, the program allows managers to compare the probability of realising benefits of different management options before making their decisions.

However, there are also some limitations. For example, before the tool can be used researchers must conduct reviews of scientific literature and analyse the results; this is a complex and time-consuming process. In addition to this, the underlying statistical model is vulnerable to a phenomenon called 'publication bias', the fact that studies with positive results are more likely to be published than studies with negative results. This could skew the outcome of the tool to suggest that management options are more likely to be successful than they truly are. However, it should be noted that this is a problem for anyone examining the evidence within scientific literature.

The development of this tool is an important step forward in terms of facilitating the use of existing scientific knowledge to enable evidence-based environmental decision making, and could easily be adapted to suit a wide range of other management or conservation issues, the researchers say. They recommend other researchers to develop similar tools when reviewing the effectiveness of interventions.



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